

REMARKS

Claims 25 and 28-48 are pending in this application. Claims 26 and 27 were canceled in the previous Amendment dated March 19, 2002.

The present invention is directed to a device for investigating reactions between interactive chemicals for biological species. The device includes a substrate and a plasma layer. The substrate includes a film of free electron metal that consists essentially of gold. The plasma layer which includes sulfur is deposited directly on the film of free electron metal of the substrate. The combination of a sulfur-containing plasma layer deposited directly onto a gold surface results in a stable surface that does not suffer from loss of mass of the surface upon further treatment. This new and unexpected result which finds support in Tables 1 and 4 of the present specification is not disclosed in any of the prior art references cited by the Examiner.

The Examiner has maintained his obviousness rejection of the claims in this final Office Action for the same reasons discussed in the October 24, 2001 Office Action. Claims 25, 28-34, 37-40, 44-45, and 48 stand rejected under 35 U.S.C. § 103(a) for obviousness over European Patent No. 0104608 to Dunn et al. (hereinafter "the Dunn patent") in view of United States Patent No. 5,627,079 to Gardella et al. (hereinafter "the Gardella patent"). Claim 35 stands rejected under 35 U.S.C. § 103(a) for obviousness over the Dunn patent in view of the Gardella patent and United States Patent No. 5,723,219 to Kolluri et al. (hereinafter "the Kolluri patent"). Claim 36 stands rejected under 35 U.S.C. § 103(a) for obviousness over the Dunn patent in view of the Gardella patent and United States Patent No. 5,932,296 to Sluka et al. (hereinafter "the Sluka patent"). Claims 41-43 and 46-47 stand rejected under 35 U.S.C. § 103(a) for obviousness over the Dunn patent in view of the

Gardella patent and United States Patent No. 5,991,488 to Salamon et al. (hereinafter “the Salamon patent”).

Regarding the obviousness rejection of claims 25, 28-34, 37-40, 44, 45, and 48, the Examiner maintains his reliance on the Dunn patent for the teaching of depositing plasma directly to the surface of a substrate. Further, the Examiner combines the Dunn patent with the Gardella patent for the teaching of a gold substrate. In view of the new and unexpectedly improved result (i.e., a stable surface), the Examiner has insufficient basis to combine these two primary references and arrive at the claimed invention.

Comparative test data shown in Table 1, page 7 and Table 4, page 11 of the present specification show the percentage of gold in a surface composition before and after rinsing. When a less stable plasma layer is deposited onto a gold surface, more gold from the underlying gold surface appears at the surface deposited layer after rinsing.

Table 1 of the present specification shows the percentage of gold in the surface composition before and after rinsing where the plasma deposited layer did not include sulfur. The results show 6.8% gold in the surface composition before rinsing and 13.4% gold after rinsing (i.e., a 98% increase). In contrast, Table 4 of the present specification shows the percentage of gold in the surface composition before and after rinsing where the plasma deposited layer includes sulfur. The results show 0.7% gold in the surface composition before rinsing and 0.9% gold after rinsing (i.e., a 28% increase).

The results from the plasma deposited layer that does not include sulfur shows a significant increase of gold in the surface composition layer after rinsing as compared to the plasma layer that includes sulfur. In other words, the plasma deposited layer that included sulfur lost only 0.2% of its original mass as compared to 6.6% loss in mass when the plasma layer did not include sulfur. Therefore, there is no motivation, suggestion, or reasonable expectation of success in either the Dunn patent or the Gardella patent, alone or in

combination, to produce this stable plasma deposited layer. The motivation to combine the gold substrate described in the Gardella patent with the sulfur-containing plasma layer described in the Dunn patent cannot be derived from the Applicants' specification.

In addition, the difference in the unexpected results (i.e., 0.2% v. 6.6%) are statistically and practically significant. See Ex parte C, 27 U.S.P.Q. 2d 1492, 1497 (Bd Pat. App. & Int. 1993). This difference has statistical significance because the loss of mass in the surface composition of a plasma layer that does not include sulfur is **33** times greater than the loss of mass on the surface composition of the sulfur-containing plasma layer. When the underlying substrate or surface layer is gold, this difference becomes practically significant. As of early December 2002, the cost of an ounce of gold ranged from \$325.00 to \$330.00. This cost becomes significant when the substrate is very large and the plasma deposited layer is used to protect the underlying gold surface. For example, a 20 sq. ft. metal panel having an underlying gold surface can have over 5 sq. ft. of the gold surface exposed after rinsing when the plasma layer does not include sulfur. In contrast, less than 1 sq. ft. of the gold surface would be exposed after rinsing when the plasma layer includes sulfur. In certain environments where the gold surface can easily wear off, five times as much gold could be lost in the exposed 5 sq. ft. area as compared to the 1 sq. ft. area. This results in five times the cost when repairing or reconditioning the underlying gold surface. At over \$325.00 per ounce of gold, the practical significance becomes very substantial.

In view of the above, there is no motivation, suggestion, or reasonable expectation of success to combine the two primary references and arrive at the new and unexpected result of a stable plasma deposited layer of the claimed invention. Therefore, reconsideration of the obviousness rejection of claims 25, 28-34, 37-40, 44, 45, and 48 is respectfully requested.

Regarding the obviousness rejection of claim 35 over the Dunn patent in view of the Gardella patent and further in view of the Kolluri patent, the Examiner relies on the Kolluri patent for the teaching of the use of a gas monomer in plasma polymerization techniques. Claim 35 depends directly from claim 33 and is allowable over the teachings of the two primary references for the reasons discussed above. Therefore, the subject matter of claim 35 is believed to be distinguished over these combined teachings, as combined in the manner suggested by the Examiner, for substantially the same reasons discussed above in connection with claims 25 and 33.

Regarding the obviousness rejection of claim 36 over the Dunn patent in view of the Gardella patent and further in view of the Sluka patent, the Examiner relies on the Sluka patent for the teaching of the step of cleaning the substrate by means of a pulse argon plasma before the application of the functional groups to the substrate. Claim 36 depends directly from claim 33 and is allowable over the teachings of the two primary references for the reasons discussed above. Therefore, the subject matter of claim 36 is believed to distinguish over these combined teachings, as combined in the manner suggested by the Examiner, for substantially the same reasons discussed above in connection with claims 25 and 33.

Regarding the obviousness rejection of claims 41-43, 46, and 47 over the Dunn patent in view of the Gardella patent and further in view of the Salamon patent, the Examiner relies on the Salamon patent for the teaching of a surface plasmon resonance spectroscopy. Claims 41-43, 46, and 47 depend either directly or indirectly from claim 33 and are allowable over the teachings of the two primary references for the reasons discussed above. Therefore, the subject matter of claims 41-43, 46 and 47 is believed to distinguish over the combined teachings, as combined in the manner suggested by the Examiner, for substantially the same reasons as discussed above in connection with claims 25 and 33.

CONCLUSION

In view of the foregoing, Applicants believe that claims 25 and 28-48 are patentable over the prior art of record and are in condition for allowance. Reconsideration of the Examiner's rejections and allowance of claims 25 and 28-48 are respectfully requested.

Respectfully submitted,

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